

A MODEL OF ABSORPTIVE CAPACITY IN PUBLIC SECTOR: BASED ON INDIVIDUAL AND ORGANIZATIONAL COGNITIVE PROCESS

Nader Salehi, Rozeyta bt Omar (PhD) & Kamariah bt Ismail (PhD)

Faculty of Management and Human Resource Development
Universiti Teknologi Malaysia (UTM), 81310, Johor, Malaysia
Snader2@live.utm.my

ABSTRACT

Organization's environment is dynamic and changing fast. Knowledge-based organization relies on external knowledge as different type of knowledge that facilitates and improves processes and services for citizen and stakeholders. A successful organization focuses and looking for new external knowledge and generate new value. The absorptive capacity is critical capability which leads organization to successfully innovation performance. This phenomenon achieve new external knowledge for innovative process in two points. This paper purpose two levels of cognitive structure to identify and evaluate knowledge which are essential to provide innovation for responsiveness citizen and stakeholders in public sector. Both levels identify and evaluate knowledge from external sources that depend on their views and perspectives how they interpret environment. We explain how organization in public sector enhances innovation performance within absorptive capacity. In this model, prior knowledge, government strategy and social integration mechanisms are antecedents of absorptive capacity which represent how much organization successfully able to absorb distant knowledge from environment. Organization culture and regimes of appropriability also play roles of moderator in this model. These variables interact and play enforces rules. Absorptive capacity also play role of mediator and finally innovation performance is consequence in this model.

Keywords: *Absorptive Capacity, Innovation Performance, Social Integration Mechanism, Government Strategy, Prior Knowledge, Regimes of Appropriability*

1. INTRODUCTION

Nowadays, organization's environment is dynamic and changing fast. Technology is constantly changing and becoming more complex. Organizations are seeking new knowledge to improve efficiency of administration processes and public services. In public sector, innovation is justifiable when it provides new service or process and increase quality (Hartley, 2005). Hence, this phenomenon on how organizations take advantage from new external knowledge is complicated. Organizations have found that they should invest more in knowledge absorption process. Lack of new knowledge leads organizations to reduce quality of technological knowledge even quality of decision making also can

increase costs of production and services. Otherwise, organization eliminates service for stakeholders in government purposes. Knowledge-based organizations in public sector require a new approach in attracting new external knowledge which led them to the creation of innovation. They need to improve processes and services for customers' satisfaction and stakeholders. Citizens and stakeholders expect the service quality and the latest technological advancements with the lowest prices from public sector. Therefore the public sector and private sector must follow customer satisfaction and quality of service as the goal in this sector. Government agencies that provide services for customers and stakeholders should utilize their abilities to apply new knowledge from external environment to innovate new processes and service.

In the past decades, researchers mentioned to type of capability as important prerequisite for innovation (Cohen and Levinthal, 1990; Lane and Lubatkin, 1998; Zahra and George, 2002; Liao et al., 2010; Zhixiong, Yuanjian, 2010; Zhou and Wu, 2010). They implied that this phenomenon on how organization, appropriate and apply new external knowledge for development of technological innovations is called Absorptive Capacity (AC). First of all, in 1990 Cohen and Levinthal briefed prior knowledge as determinant of AC. They viewed on AC as static capability. In 2002, Zahra and George completed the conceptualization of AC and described AC as multidimensional and dynamic capability. Capability of AC is the sum of abilities that enables organization does acquisition, assimilation, transformation and utilization new external knowledge (Zahra and George, 2002; Zhixiong, Yuanjian, 2010). Therefore, AC is an organization's capability to deal with external knowledge and it is a routine and strategic process, which an organization reconstructs, own knowledge building and applies it to sustain competitive advantage (Zahra and George, 2002). In this paper we focus how organizations in public sector absorb distant knowledge. On the other hand, it is also discuss on how individual and organizational cognitive processes influence on capability of AC. We attempt to provide an integrative framework for AC in public sector to achieve innovation performance. This framework elaborates knowledge absorption in knowledge-based organizations.

2. KNOWLEDGE

Nonaka (1994) defined knowledge as "Justified true belief" which promotes organization's successful actions. Nonaka (1994) posited that knowledge is having many aspects through having many layers meaning. Nonaka also described formation as a stream of intimation, which eventually develops knowledge. Cohen and Levinthal (2002) stated that external knowledge is critical to organization' innovation process. Chilton and Bloodgood (2007) claimed that knowledge is the core of competitive advantage in organization. They added that level of knowledge in organization indicates how much able to apply new external knowledge. Besides that, they also argued that the worthiness of knowledge depends much on its sources. Zahra et al. (2009) mentioned that new knowledge can appear through discussions among the managers about environment, business and customers in terms of AC. In the last few decades, researchers mentioned that knowledge develop organization performance (Duan et al., 2010). Knowledge also could improve government performance, optimize work flow, enhance service efficiency as well as promote adaptability and innovation. New knowledge flow through, determine citizen and society needs, determine broad services and organizational objectives, newspaper, magazines, television and internet, citizen interview, stakeholders recommendation, survey, groups' behavior and experts or universities.

3. INDIVIDUAL AND ORGANIZATIONAL COGNITIVE PROCESS

Learning from environment can be in two ways, individual and organizational cognitive processes. Individual and organizational cognitive processes are perception and behavior of individuals and organizations to correspond with environment and their action to apply new external knowledge. Recognition process is fundamental in any organization system but it depends on operation system that how much organization respects to make use new knowledge. Organizations to extend knowledge AC needs to nurture through individual and organizational cognitive processes. Both aspects of individual and organizational cognitive process play significant role to consider environment and develop framework for knowledge absorption. This is because both of them have different views and perspectives. This recognition can be presupposition in process of AC and organizational performance. This is also clear that in cognitive structure the individuals' levels justify and enrich organizational level (Cohen and Levinthal, 1990).

In individual cognitive process, organization members may have different beliefs and perspectives as well as motivation or demands because they have variety conditions and life. Organizational members usually have different value which may collaborate with organizational strategy and knowledge. Organizational cognitive process is sum of individual, groups, managers, leaders, and other people in organizational behavior to learning knowledge from environment based on organizational laws and regulations. These two types of cognition processes depend on how individuals and organizations interpretation and harvested knowledge from external sources.

The model of AC in public sector based on individual and organizational cognitive process illustrate in Figure 1.

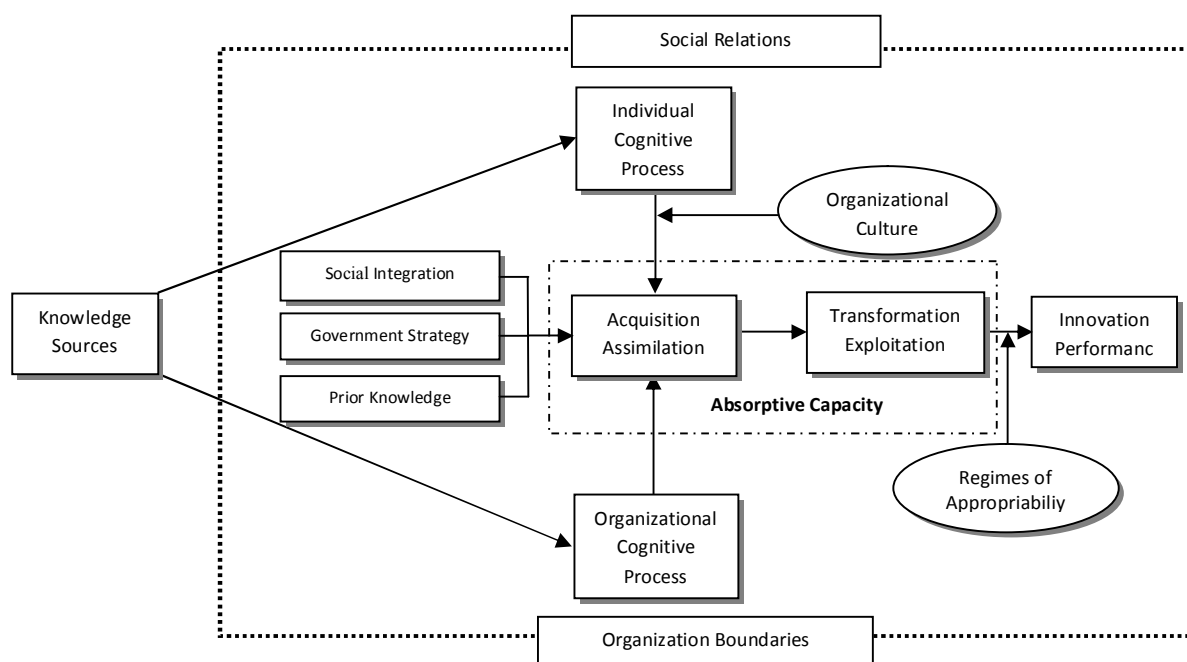


Figure 1: The Role of Absorptive Capacity in Public Sector

4. ABSORPTIVE CAPACITY

In different contexts that are related to innovation, AC has been examined as a key variable to innovate new (Stocka, et al., 2001). Many scholars explained the concept of AC as capability for dealing with external knowledge (Cohen and Levinthal, 1990; Barney, 1991; Van den Bosch et al., 1999; Nonaka and Nishiguchi, 2001; Zahra and George, 2002; Gray, 2006; Todorova and Durisin, 2007; Zahra et al., 2009; Fabrizio, 2009; Harris and Liy, 2009; Schmidt, 2010; Camison and Fores, 2010; Zhixiong and Yuanjin, 2010). Cohen and Levinthal (1990) defined AC as “prior related knowledge confers and ability to recognize the value of new information, assimilation it, and apply it to commercial ends”. Zahra and George (2002) defined AC as “a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic capability”. Liao et al. (2009) pointed that AC concentrates and organizes the communications between the organizations and external knowledge sources. Cohen and Levinthal (1990) and Schmidt (2010) and Zhixiong and Yuanjian (2010) stated that AC can be measured by prior related knowledge and individual’s skills. AC can be measured by the percentage of workforce with bachelor degree qualification and last but not least, through the percentage of workforce with relevant qualification. Many researchers mentioned that AC has four capabilities as acquisition, assimilation, transformation and exploitation external knowledge (Cohen and Levinthal, 1990; Szulanski, 1996; Zahra and George, 2002; Vega-Jurado et al., 2008; Peters and Johnston, 2009; Zhixiong, Yuanjian, 2010).

The first ability of AC is knowledge acquisition. Ability of acquiring external knowledge is locating, identifying, valuing and acquiring it that is critical to an organization’s processes (Lane and Lubatkin, 1998; Zahra and George, 2002; Liao et al., 2010). Acquiring knowledge can be assumed as a process of gathering and learning from external sources. It requires collaborative efforts and much experience in recognizing and capturing new knowledge (Cohen and Levinthal, 1990; Zahra and George, 2002; Liao et al., 2009). Xiu-mei et al. (2006) mentioned that acquiring external knowledge can be measured by organizing educational visits to other enterprises, by collecting information through informal means and by having regular meetings with customers or other relevant parties.

The second ability of AC is knowledge assimilation. The ability to assimilate the external knowledge refers to an organization's capacity to absorb external knowledge. This ability can also be defined as the internal practices that the new information or knowledge acquire, analyzed, interpret, understood, internalize and classify (Cohen and Levinthal, 1990; Szulanski, 1996; Zahra and George, 2002; Zhixiong and Yuanjin, 2010). Xiu-mei et al. (2006) mentioned that assimilation of external knowledge can be measured by first, recognizing the shifts in market. Second, by understanding how the new opportunities can be served quickly to customers and third, by analyzing and interpreting the changing market fast.

The third ability of AC is knowledge transformation. Many scholars described the ability of transformation knowledge to the development and the refinement of the internal practices to convey and combine previous knowledge with new external knowledge assimilated (Van den Bosch et al., 1999; Zahra and George, 2002; Zhixiong and Yuanjin, 2010; Zhou and Wu, 2010). In this step, base on existing knowledge organization interpret, add or eliminate new knowledge (Van den Bosch et al., 1999). Zhu et al. (2006) mentioned that transformation of the external knowledge can be measured by: 1) employees’ record and the newly acquired knowledge stored for future reference, 2) practical experiences shared among employees, and 3) regular meetings on the consequences of market trends and new product and service process.

The latest ability of AC is knowledge exploitation. The ability of applying or exploiting the external knowledge refers to the organization's ability based on practices that enable organization to integrate new external knowledge which acquired, assimilated and transformed into different and innovative way. This step will not only refinement or interpret new knowledge, but also new product development, organization forms, new services, competences or goods (Cohen and Levinthal, 1990; Lane and Lubatkin, 1990; Zahra and George, 2002; Liao et al., 2010; Zhixiong and Yuanjin, 2010; Zhou and Wu, 2010). Xiu-mei et al. (2006) mentioned that exploitation of the external knowledge can be measured by: 1) constant consideration on how organization exploits knowledge, 2) clear division of roles and responsibilities, and 3) prompt feedbacks in attending customers' complaints.

5. ORGANIZATIONAL ANTECEDENTS

Fasnacht (2009); Chesbrough (2003); Dewar and Dutton (1986) mentioned that AC may lead to different outcome. Zahra and George (2002); Peters and Johnston (2009) mentioned that antecedents of AC lead organization to competitive advantage. Many researchers studied about aspects and characteristics which may influence on the capability of AC as organizational antecedents that can have positive or negative effects in the process of creation new value. For instance, prior knowledge and experiences (Cohen and Levinthal, 1990; Zahra and George, 2002; Brown and Eisenhardt, 1995; Stocka, et al., 2001). Organizations must extend and combine their abilities to intensify the capability of AC for acquisition, assimilation, transformation and exploitation new external knowledge (Jansen et al., 2005).

In 1990, Coehn and Levinthal mentioned that prior knowledge enhance learning from other sources. Many scholars mentioned the role of prior knowledge and skills as determinant of AC (Cohen and Levinthal, 1990; Zahra and George, 2002; Escribano et al., 2009; Fabrizio, 2009; Vega-Jurado et al., 2008). Mockler and Goeller (1991) defined prior knowledge as work experiences and skills which lead organization to success. According to Cohen and Levinthal (1990) "the ability to evaluate and utilize outside knowledge is largely a function of prior related knowledge". Duan et al. (2010) mentioned that AC is appropriate in gaining new external knowledge whereby it must have some strong fundamental abilities related to the knowledge structure. These abilities are: 1) the ability to appraise knowledge, 2) the ability to recognize knowledge, 3) the ability to absorb knowledge, 4) the ability to share knowledge, 5) the ability to use internal knowledge, 6) the ability to convey knowledge, 7) the ability to utilize knowledge, and 8) the ability to innovate.

Vegan-Jurado et al. (2008) mentioned that organizational knowledge is measured according to the individual's skills and the organizational experiences. Lane and Lubatkin (1998) proposed that organizational knowledge is determined by inter-organizational learning. Vega-Jurado et al. (2008) implied to level of education of workforce also Schmidt (2010) mentioned to level of employees' skill that they measured by the number and amount of employees with higher education qualification.

Government strategy represents objective, framework and sets of activities and function that customize intensity, facilities and participate effectively in the capability of AC. In other words, strategy is the main driver to address gaps for the adaption of diverse AC in public sector. Government strategy follows and considers providing sufficient guidance in public sector on how and optimizing the effectiveness services. Strategy also shows how public sector develops and derives capability of AC and manages knowledge through abilities of acquisition, assimilation, transformation and exploitation in organization.

Ashforth, et al (2008) stated that “organizational socialization is typically defined as the process through which individuals acquire knowledge about and adjust to their work context”. Cohen and Levinthal (1990); Zahra and George (2002); Vega-Jurado et al. (2008) also mentioned this mechanism make possible the knowledge sharing in an organization and facilitate common language with existing skills and experience. Therefore social integration mechanisms provide capacity for relevant knowledge, improve level of knowledge, facilitate stream of knowledge, make sense individuals to connect source of knowledge, and decrease gap between abilities of AC.

6. CONTINGENT FACTORS

As shown in the model there are two factors which play role of moderator and can affect on AC and individual cognitive process. These variables interact crossover and play special power or enforce rules.

Hartley (2005) mentioned that organization can provide and develop idea and innovation which are more open and their culture and construction support them. Therefore, only employees’ ideas which do not conflict with organization’s culture and goals will be acceptable and approved.

Zahra and George (2002) claimed that “regime of appropriability refers to the institutional and industry dynamics that affect the firm’s ability to protect the advantages of new products or processes”. They mentioned when appropriability is low, investments in AC are likely to be low. These investments might be widespread. When strong appropriability regimes exist, organization will patent their innovations and protect revenue streams arising from innovations (Zahra and Georg, 2002; Todorova and Durisin, 2007).

7. INNOVATION PERFORMANCE

Mulgan and Albury, 2003; Hartley (2005) defined innovation as “novelty in action” (Altschuler and Zegans, 1997) and “new ideas that work” (Mulgan and Alburay, 2003; Hartley, 2005). Hulta et al. (2004) mentioned to the types of innovation as: 1) new structure or administrative system which improves internal operation that affects the market, or 2) new production. Xiu-mei et al. (2007) defined innovation performance as the performance improvement access through process innovation via 1) decrease cost, 2) increase sale, and 3) improve quality. Chen Heng et al. (2010) stated that innovation performance is final reflect of innovation and its lead organization to success and achieve the corresponding economic benefits.

8. CONCLUSION

Organizations in dynamic environment rely on different types of knowledge to facilitate and improve process and services in public sector. Capability of AC plays critical role to digest external knowledge which is needed for innovation. Organizations need to focus and manage all dimensions of AC to provide innovation. Organization antecedents represent intensity and how much organization able to acquire, assimilate, transform and exploit knowledge. In public sector, organizations learn from external sources

through individual and organizational cognitive processes that consider communication in social relations.

REFERENCES

- Altshuler, A. A., & Behin, R. D. (Eds.). (1997). *Innovation in American Government*. Washington, D.C.: Brookings Institution Press.
- Ashforth, B. E., Sluss, D. M., & Saks, A. M. (2007). Socialization Tactics, Proactive Behavior, and Newcomer Learning: Integrating Socialization Models. *Journal of Vocational Behavior*, 70, 447–462.
- Barney. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99-120.
- Bosh, F. A. J. V. D., Volberda, H. W., & Boer, M. d. (1999). Coevolution of Firm Absorptive Capacity and Knowledge Environment: Organizational Forms and Combinative Capabilities. *Organization Science*, 10(5), 551-568.
- Brown, S. L., & Eisenhardt, K. M. (1995). Product Development: Past Research, Present Findings, and Future Directions. *Academy of Management Review*, 20(2), 343-378.
- Camison, C., & Fores, B. (2010). Knowledge Absorptive Capacity: New Insight for Its Conceptualization and Measurement. *Journal of Business Research*, 63, 707-715.
- Cheng, Y., Madsen, E. S., & Liangsiri, J. (2010). Transferring Knowledge in the Relocation of Manufacturing Units.
- Chesbrough, H. W. (2003). *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Boston, Massachusetts: Harvard Business School Press.
- Chilton, M. A., & Bloodgood, J. M. (2007). The Dimensions of Tacit & Explicit Knowledge: A Description and Measure.
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly*, 35(1), 128-152.
- Dewar, R. D., & Dutton, J. E. (1986). The Adoption of Radical and Incremental Innovations: An Empirical Analysis. *Management Science*, 32(11), 1422-1433.
- Duan, Z., Wang, W., & Zhang, W. (2010). A Model of Chinese Government Knowledge Management Based on Absorptive Capacity.

- Escribano, A., Fosfuri, A., & Tribob, J. A. (2009). Managing External Knowledge Flows: The Moderating Role of Absorptive Capacity. *Research Policy*, 38, 96-105.
- Fabrizio, K. R. (2009). Absorptive Capacity and the Search for Innovation. *Research Policy*, 38, 255-267.
- Fasnacht, D. (2009). Open Innovation in the Financial Services Growing Through Openness, Flexibility, and Customer Integration. Verlag Berlin Heidelberg: Springer.
- Gray, C. (2006). Absorptive Capacity, Knowledge Management and Innovation in Entrepreneurial Small Firms. *International Journal of Entrepreneurial Behaviour & Research*, 12(6), 345-360.
- Harris, R., & Liy, Q. C. (2009). Exporting, R&D, and Absorptive Capacity in UK Establishments. *Oxford Economic Papers*, 61, 74-103.
- Hartley, J. (2005). Innovation in Governance and Public Services: Past and Present. *PUBLIC MONEY & MANAGEMENT JANUARY*, 25(1), 27-34.
- Hulta, G. T. M., Hurleyb, R. F., & Knight, G. A. (2004). Innovativeness: Its Antecedents and Impact on Business Performance. *Industrial Marketing Management*, 33, 249-438.
- Jansen, J. J. P., Bosch, F. A. J. V. D., & Volberda, H. W. (2005). Managing Potential and Realized Absorptive Capacity: How Do Organizational Antecedents Matter? *Academy of Management Journal*, 48(6), 990-1015.
- Lane, P. J., & Lubatkin, M. (1998). Relative Absorptive Capacity and Interorganizational Learning. *Strategic Management Journal*, 19, 461-477.
- Liao, S.-H., Wu, C.-C., Hu, D.-C., & Tsuei, G. A. (2009). Knowledge Acquisition, Absorptive Capacity, and Innovation Capability: An Empirical Study of Taiwan's Knowledge-Intensive Industries.
- Liao, S.-h., Wu, C.-c., Hu, D.-c., & Tsui, K.-a. (2010). Relationships Between Knowledge Acquisition, Absorptive Capacity and Innovation Capability: an Empirical Study on Taiwan's Financial and Manufacturing Industries. *Journal of Information Science*, 36(1), 19-35.
- Mockler, R. J., & Goeller, T. (1991). Using Knowledge-Based Systems for Entrepreneurial New Venture Analysis. Paper presented at the IEEE/ACM International
- Mulgan, G., & Albury, D. (2003). innovation in the Public Sector. from Cabinet Office, London.
- Nonaka, I. (1994). A Dynamic Theory of Organizational Knowledge Creation. *ORGANIZATION SCIENCE*, 5(1), 14-37.
- Nonaka, I., & Nishiguchi, T. (Eds.). (2001). *Knowledge Emergence: Social, Technical, and Evolutionary Dimensions of Knowledge Creation*. New York: Oxford University Press.

- Peters, L. D., & Johnston, W. J. (2009). Understanding Absorptive Capacity from a Network Perspective. *Journal Business Management*, 3(1), 29-50.
- Schmidt, T. (2010). Absorptive Capacity - One Size Fits All? A Firm-level Analysis of Absorptive Capacity for Different Kinds of Knowledge. *Managerial and Decision Economic*, 31(1), 1-18.
- Stocka, G. N., Greisb, N. P., & Fischer, W. A. (2001). Absorptive Capacity and New Product Development. *Journal of High Technology Management Research* 12, 77-91.
- Szulanski, G. (1996). Exploring Internal Stickiness: Impediments to The Transfer of Best Practice Within The Firm.
- Todorova, G., & Durisin, B. (2007). Absorptive Capacity: Valuing a Reconceptualization. *Academy of Management Review*, 32(3), 774-786.
- Vega-Jurado, J., Gutierrez-Gracia, A., & Fernandez-de-Lucio, I. (2008). Analyzing the Determinants of Firm's Absorptive Capacity: Beyond R&D. *R&D Management*, 38(4), 392-405.
- Xiu-mei, Z., Li, C., & Qi-guo, C. (2006). Empirical Analysis on the Mediating Role of Absorptive Capacity Between Knowledge Spillover and Innovative Performance of Firms with High-tech Industry Cluster.
- Zahra, S. A., Filatotchev, I., & Wright, M. (2009). How Do Threshold Firms Sustain Corporate Entrepreneurship? The Role of Boards and Absorptive Capacity. *Journal of Business Venturing*, 24, 248-260.
- Zahra, S. A., & Geroge, G. (2002). Absorptive Capacity: Areview, Reconceptualization, and Extension. *Academy of Management Review*, 27(2), 185-203.
- Zhixiong, X., & Yuanjian, Q. (2010). Research on Knowledge Absorptive Capacity of Enterprise. Paper presented at the Networked Computing (INC), 2010 6th International Conference.
- Zhou, K. Z., & Wu, F. (2010). Technological Capability, Strategic Flexibility, and Product Innovation. *Strategic Management Journal*, 31, 547-561.